

# Economic Analysis of Market Performance of Fresh Fish in Lagos State, Nigeria

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**Abstract**— This study analysed the market performance of fresh fish marketing in Lagos state, Nigeria. It critically focused on ascertaining the market structure, determine the profitability of fish marketing and determining the marketing efficiency of fresh fish marketing in the study area. Multistage sampling procedure was used to sample 80 fresh fish marketers from Lagos state. The data collected for the study were analysed using Gini coefficient, budgetary technique and shepherd efficiency model. The study revealed that there was inequality in the income distribution among the fresh fish marketers with Gini coefficient of 0.78, it further shows that fresh fish marketing is profitable with gross margin of #27,101.36 and that fish marketing activities among fish marketers is highly efficient (517.5%). Thus, government should help in the provision of a soft loan to the marketers so as to promote fresh fish marketing being a profitable and efficient business.

**Keyword**— Market Performance, Market Structure, Profitability, Market Efficiency.

## I. INTRODUCTION

Fish marketing is a primordial economic activity in Nigeria (Agbebi, 2010). Its activities cover both the coastal and inland waterways and it was of tremendous economic value to the pre-colonial Nigerians (Ehinmore, 2007). Although, fresh fish were said to be marketed mostly in short distance areas owing to the perishable nature attached to it.

Fish is a major source of animal protein and an essential food item in the diet of many Nigerians, being relatively cheaper than meat. Accordingly, agricultural production and fish marketing must develop hand in hand because they are partners in a progressive system (Iliyasu, Onu, Midau and Fintan, 2011).

Assessment of how well the process of marketing is carried out, and according to Awol (2010) performance is how successfully its aims are accomplished. Is produce assembled and delivered on time and without wastage? Is it well packed and presented attractively? Is its quality reliable and are contract kept? Is the consumption of the products increasing and sales in competitive market

expanding? There are such many practical indications of how well a certain marketing system is operating.

Also, the form in which markets are structure is almost assumed to rigidly determine each firm's conduct (output decisions and pricing behaviour), which yields an industry's overall performance (e.g. its efficiency and profitability) (Umoinyang, 2014).

Meanwhile, to be more profitable, fish trade requires every activity that increases sales revenue and as well decreasing the costs of marketing, thus profitability of fish is the measure of fish profit against its power to earn profit (Monica, 2014).

An efficient marketing system ensures that goods which are seasonal will be available all year round, with little variation in prices, which can be attributed to cost of marketing functions like storage, processing, transportation(Nwaru, Nwosu and Agummuo,2011).Thus, marketing efficiency increases with continued transitions and specialized functions like wholesale and retail (Enete, 2008). This supported the claim of Adegeye and Dittoh (1985) that the general-purpose of marketing efficiency is to provide goods to consumers in the required form at the required time and place with the lowest possible marketing costs consistent with the interests of the producers.

An extensive literature survey has been carried out on economic analysis of fresh fish marketing performance with empirical evidence from many studies and special attention paid to the market structure, profitability and factors influencing it and the efficiency of fish marketing. Evidence from Adeleke and Afolabi, (2012) and Edward and Madugu, (2011) have established the profitability and marketing efficiency of fresh fish marketing. Also, Bakenya, Theodora, Twinamasiko and Molnar. (2012) and Abdal and Eglal, (2010), in their study, assert that fish marketing profitability is eminent with high market performance. However, the scholars' works on the, performance offresh fish marketing in Nigeria are still limited. Thus, this study seeks to explore the performance of fresh fish marketing by ascertaining the market structure,

determined the profitability, determinant of income and efficiency of fresh fish in the study area.

## II. METHODOLOGY

### The study area, Sampling Technique and Data Collection

This study was carried out in Lagos State, located within the southwest Nigeria. Farming is part of the notable occupation of the people most especially along the coast as well as other related activities.

Multistage sampling procedure was used for this study which involves purposive selection of Lagos State in the first stage being one of the notable fishing states in Nigeria, purposive selection of two Local Government Areas (LGA's) namely Ibeju-Lekki and Ikorodu LGA's because of the prevalence of fresh fish marketers in the area. In the third stage, two communities were selected using purposive sampling technique. The selected communities are Orimedu and Otto in Ibejulekki and Ijede and Ipakodo in Ikorodu local government respectively. In the last stage, ten fresh fish marketers were selected from each of the four communities using snowball sampling technique. Thus, a total of 80 marketers/respondents were used for this study. Structured questionnaires were administered and responses were analyzed using descriptive statistics, Gini coefficient, budgetary techniques and shepherd index.

### Analytical techniques

The data obtained from the respondents were subjected to descriptive and inferential statistics. Inferential statistics such as Gini coefficient was used to ascertain the market structure of fresh fish marketing, budgetary technique was employed to ascertain the profitability of fresh fish marketing and shepherd index was used to determine the marketing efficiency of fresh fish marketing in the study area.

### Model Specification

**Gini Coefficient:** The Gini coefficient mathematically, it is explicitly represented by

$$GC = 1 - \sum [X_{t-1} * Y_{t-1}]$$

Where:

$N$  = is the number of elements (observations)

$X$  = Proportion of Fresh fish seller

$X$  = Proportion of fish seller is given as  $X = \frac{\text{No of fish seller in a market}}{\text{overall No of fish Marketers under study}}$

$\sigma X (X_{t-1})$  = Cumulative Proportion of fish sellers ( $X$ )

$Y$  = Proportion of total sales by Fresh fish marketer

$Y = \frac{\text{Proportion of total sales is given as:}}{\text{total sales of fish in a market}} = \frac{\text{overall total sales of fish in all the Markets under study}}{\text{total sales of fish in a market}}$

$$\sigma Y (Y_{t-1}) = \text{Cumulative Proportion of total sales (Y)}$$

**Budgetary Technique:** The budgetary technique encompasses the analyses of the gross margin which involves the cost and return analysis of fish marketing in the study area. The gross margin formula is explicitly stated below:

The budgetary technique involves the cost and return analysis of fish marketing in the study area. It is explicitly stated as:

$$G.M = \sum (P_{ij}Q_{ij} - r_{ij}X_{ij})$$

$P_{ij}$  = Price of fish in  $i^{th}$  for  $j^{th}$  respondent.

$Q_{ij}$  = Quantity of fish in  $i^{th}$  for  $j^{th}$  respondent.

$r_{ij}$  = Price of Variable Input in  $i^{th}$  for  $j^{th}$  respondent.

$X_{ij}$  = Quantity of Variable Input in  $i^{th}$  for  $j^{th}$  respondent.

The profitability and efficiency ratio was calculated as follows:

Profitability ratio is given as:  $\frac{\pi}{TVC}$

Efficiency ratio is given as:  $\frac{TR}{TVC}$

a.  $\frac{TR}{TVC} > 0$  = It is operational efficiency

b.  $\frac{TR}{TVC} < 0$  = It is operational inefficiency

c.  $\frac{\pi}{TVC} > 0$  = It is profitable

d.  $\frac{\pi}{TVC} < 0$  = It is not profitable

Thus, the values in the Profitability and Efficiency ratio were computed in the marketing of fish in the study area.

Where:

$\Pi$  = Profit

TR = Total Revenue

TVC = Total Variable Cost

### Multiple Regression Model

Multiple regression is one of the analytical tools that are used to determine the effect(s) of one or more variables on another. The marketing function postulated for fresh fish trader's annual income in the study area is implicitly presented by  $Y = f (X_1, X_2, X_3, X_4, X_5, X_6, u_i)$  as shown below:

Where  $Y$  = Annual Income from Fish Marketing (₦)

$X_1$  = Age of respondents (years)

$X_2$  = Fish Marketing experience (years)

$X_3$  = Number of year spent in school (year)

$X_4$  = Cost of purchase (₦)

$X_5$  = Cost of transportation (₦)

$X_6$  = Membership of association (Yes = 1, No = 0)

$X_7$  = Price per kg of fish (₦)

$X_8$  = Quantity of Fish Sold (Kg)

**Shepherd efficiency models:** The Shepherd efficiency models used by Massoud and Gowda, (2012) and developed by Shepherd, (1965) was used to analyze the marketing efficiency of fish marketing by estimating as follows:

**Marketing cost:** The total marketing cost was determined by the following formula:

$$TC = C_p + \sum M_{ci} \quad (1)$$

Where:

$$i = 1$$

TC = Total Cost of Marketing

C<sub>p</sub> = Producer cost of marketing

M<sub>ci</sub> = Marketing cost by the ith trader

**Marketing margin:** The absolute margins of both the processed and unprocessed fish retailers were determined as follows:

$$AM = Ps_a - (Pba + Mc) \quad (2)$$

AM = Absolute Margin

P<sub>s</sub>a = Selling price

P<sub>ba</sub> = Buying price

Mc = Marketing cost

**Producer' share in the consumer price:** The producer' share in the consumer price was calculated by the following indicator:

$$Ps = \frac{Pp}{Pr} \times 100$$

Ps = Producer' share in the consumer price

P<sub>p</sub> = Producer' price

P<sub>r</sub> = Retail price or final consumer price

**Marketing efficiency with Shepherd Index** proposed to evaluate the marketing efficiency of fish marketing activities. It is given by:

$$ME = \frac{Pr}{TC + AM} \quad (4)$$

Pr = Retail price or final consumer price

TC = Total Cost of Marketing

AM = Absolute Margin

$$ME = \frac{\text{Value added by Marketing}}{\text{Marketing cost or cost of markeying services}} \times 100$$

Pr = Retail price or final consumer price

TC = Total Cost of Marketing

AM = Absolute Margin

### III. RESULTS AND DISCUSSION

#### Market Structure

The Gini coefficient of 0.78 was revealed (Table 1), indicated high level of inequality distribution of sales income for fresh fish market in the study area. This was in line with Dillion and Hardaker (1993) in their finding that the value of Gini coefficient greater than 0.35 is high indicating inequitable distribution of sales income/sales. This was evidenced with the total income generated from total sales at ₦17,914,000 while 82.5% and the remaining 17.5% of the total sales contributed ₦10,964,000 and ₦6,950,000 respectively. This deduces that only 17.5% of the respondents played an active role in the market while majority (82.5%) of the respondents have low funding for their marketing activities in the study area.

Table.1: Computation of Gini Coefficient for Fresh Fish Market Structure in the Study Area

Income	No of sellers	%	Cum %	Proportion of seller s (X)	Cumulative proportion of seller s	Total sales	Cum Total Sales	Proportion of total sales (Y)	Cumulative proportion of total sales	XY
<150,000	39	48.75	48.75	0.49	0.49	5,133,000	5,133,000	0.29	0.29	0.141375
150,001-250,000	17	21.25	70	0.21	0.7	2,761,000	7,894,000	0.15	0.44	0.031875
250,001-350,000	10	12.50	82.5	0.13	0.83	3,070,000	10,964,000	0.17	0.61	0.0215
350,001-450,000	5	6.25	88.75	0.06	0.89	2,020,000	12,984,000	0.11	0.72	0.006875
450,001-550,000	5	6.25	95	0.06	0.95	2,450,000	15,434,000	0.14	0.86	0.00875
550,001-650,000	3	3.75	98.75	0.04	0.99	1,780,000	17,214,000	0.1	0.96	0.00375
>650,000	1	1.25	100	0.01	1	700,000	17,914,000	0.04	1	0.0005
<b>Total</b>	<b>80</b>	<b>100</b>				<b>17,914,000</b>				0.214625

Source: Analysis of Field Survey 2017

Using the formula, Gini-Coefficient (GC) =  $1 - \sum XY$

**Fresh Fish Market Structure:**  $GC_F = 1 - 0.214625$   
= **0.785375**

### Profitability Analysis

The measure of the cost and return analysis of the marketers in the study area was carried out using the budgetary technique. The result in Table 2 showed that the cost of purchase gulped up to 91.97% of the total variable cost for the fresh fish marketers. Also, the table revealed that a marketer earned average revenue of ₦223,925.00 but incurred a total variable cost of ₦196,466.73 over the same period. This indicates that an average marketer earned ₦27,458.28 as gross margin per year suggesting that fresh fish marketing is a profitable venture in the study area. This is evident in the study of Adeleke and Afolabi, (2012) which indicates that fresh fish marketing is a profitable venture. The result of the profitability ratio or the return on investment (ROI) was 0.14 indicating that for every ₦1.00 spent on fresh fish marketing 14kobo is gained by the marketers.

*Table.3: Computation of cost and return analysis of the fresh fish marketers*

Item	Cost (₦)	% TVC
Cost of purchase	14,455,638	91.97%
Transportation	5,76,500	3.67%
Labour	8,800	0.05%
Bowl	186,000	1.18%
Bracket	0	0.00%
Wire gauze	0	0.00%
Knife	33,000	2.09%
Salting	0	0.00%
Association fee	3,150	0.02%
Storage	154,500	0.98%
Rent (Space and others)	272,250	1.73%
Security	16,000	0.10%
Utility	11,500	0.07%
<b>Total TVC</b>	<b>15,717,338</b>	<b>100%</b>
<b>Average TVC</b>	<b>196,466.73</b>	
<b>Total Revenue</b>	<b>17,914,000</b>	
<b>Gross Margin (TR-TVC)</b>	<b>2,196,662</b>	
<b>Average GM</b>	<b>27,458.28</b>	
Profitability ratio		0.14

**Source:** Analysis of Field Survey 2017

### Income Determinants of Fresh Fish Marketing

The estimate of the factors influencing the income of the marketers in the study area was carried out using the

multiple regression analysis. Three functional forms of regression analysis (Table 3) was undertaken to determine the model that best fits the data with respect to coefficient of determination, F statistics and the t-value of the marketers.

The regression results show that, linear functional form had the highest  $R^2$  (i.e. coefficient of multiple determination) of 58.1% and was chosen as the lead equation. The regression results show that, the regressors combined are responsible for 58.1% of the variation in income due to these factors incorporated in the model. The remaining 41.9% are caused by other factors not included in the model. The entire equation measured by the F-ratio (11.981) is significant at 5% probability level. Regression result shows that, the cost of purchase ( $X_4$ ) is positively significant at 1% while the number of years spent in school ( $X_3$ ) and price of fish ( $X_7$ ) are also significant and positive at 5% and 1% levels respectively. The implication of this is that a unit increase in cost of purchase, price of fish and number of years spent in school would lead to a unit increase in the annual income of marketers. The positive coefficient of number of years spent in school also suggests that literate marketers may be more enterprising than their illiterate counterparts probably because of their ability to use market information to an advantage which gave credence to the findings of Adeleke and Afolabi, (2012)

Also, the marketing experience ( $X_2$ ), cost of transportation ( $X_5$ ) and membership of association ( $X_6$ ) positively and significantly influenced the income of fresh fish marketers in the study area, which indicates that an increase in these variables resulted in an increase in income of fish marketers. This implies that marketing experience, cost of transportation and membership of association are significant determinants of the income in the study area.

However, the age of the marketers negatively affected the income of marketers with t-value of -1.065, which indicates that increase in age resulted in decrease in income of fish marketers. This might be due to the strength required in the marketing of fishes. This is supported by the findings of Bassey, Okon, Ibok and Umoh, (2013) who also found out that age negatively but significantly influenced the profit of fish marketers.

Also, quantity of fish sold negatively affected the income of the marketers. This is an indication that an increase in the quantity marketed of fresh fish reduces income. This might be probably because the more the quantity of fresh fish in market, the less the marketing price probably because of the perishable nature of fresh fish.

Table.3: Computation of multiple regression analysis of the marketers

	Linear	Semi-Log	Double-Log
Variable	Coefficient (t-value in parenthesis)	Coefficient (t-value in parenthesis)	Coefficient (t-value in parenthesis)
Constant	-351119.373 (-1.450)	10.520 (12.790)	-.404 (-.089)
Age (X1)	-3231.459 (-1.065)	-.014 (-1.359)	-.751 (-1.747)
Marketing Experience (X2)	4441.984 (.749)	.004 (.214)	.079 (.653)
No of Years Spent in School (X3)	13985.915** (2.602)	.025 (1.368)	.062 (.545)
Cost of Purchase (X4)	.633*** (8.381)	1.67E-006 (6.496) ***	.326*** (5.225)
Cost of Transportation (X5)	.158 (.267)	9.64E-007 (.481)	.010 (.188)
Membership of Association (X6)	22244.821 (.454)	.086 (.515)	.003 (.011)
Price of fish (X7)	617.897*** (3.158)	.002*** (3.267)	1.832*** (2.953)
Quantity of fish sold (X8)	-64.057 (-1.642)	-5.78E-005 (-.436)	-.162** (-2.464)
R <sup>2</sup>	0.581	0.481	0.386
SE	137891.60	0.46487	0.51134
F	11.981	7.993	5.261

Source: Analysis of Field Survey 2017 \*\*\*Significant at 1% \*\*Significant at 5% and \*Significant at 10%

### Marketing Efficiency of Fresh Fish Marketing

Results in Table 4 show that, efficiency figure is far greater than 100% (i.e. 517.0%) whereas an efficiency ratio of 100% (or 1.0) indicative of efficient trading/marketing activities. Thus, fish marketing activities among fresh fish marketers is highly efficient. The result also, indicate that an increase in the cost of performing marketing service by 100 percent will give a more than proportionate increase of 417.0 percent in the level of satisfaction derived from a kilogram of fresh fish sold in the market.

Table.4: Computation of marketing efficiency of fresh fish marketing

Efficiency Variables	Fresh Fish
<b>Total Cost of Marketing</b>	
Cost of Produce	14,455,638
Transportation	576,500
Labour	8,800
Bowl	186,000
Bracket	0
Wire gauze	0
Knife	33,000

Salting	0
Association fee	3,150
Storage	154,500
Rent	272,250
Security	16,000
Utility	11,500
<b>Marketing cost by ith trader</b>	1,261,700
<b>Total Cost of Marketing</b>	<b>15,531,338</b>
<b>Absolute margin</b>	
Selling Price (Ps)	17,914,000
Total cost of marketing (Mc)	15,531,338
Buying Price (Pb)	14,455,638
	<b>-12,072,976</b>
<b>Producer Share</b>	
Price of buying fish	14,455,638
Price of selling fish	17,914,000
Producer share	0.80
Percentage of Producer share	80%
<b>Marketing Efficiency</b>	
ME	5.17
ME%	517.0%

Source: Analysis of Field Survey 2017

#### IV. CONCLUSION

The study showed that more female (81.25%) and more (90%) youth within the age bracket of 21-50 years with majority (57.5%) of married are involved in fresh fish marketing. There was an uneven distribution of income in the market with majority (82.5%) of fish marketers having low funding for their marketing activities with very high (0.78) Gini coefficient value. It further revealed that an average gross margin of #27,458.28 implying that fresh fish marketing was profitable. The marketing efficiency of 571.14% was revealed indicating a high efficiency. It is recommended that government should encourage marketers in the business by giving them soft loans.

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